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## NEW LORICARIATE, CHARACIN AND PÆCILIID FISHES FROM THE RIO CHUCUNAQUE, PANAMA

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In the examination of the fresh-water fishes collected by the author while he was attached to the Marsh-Darien Expedition of 1924, preliminary to the preparation of a report on the fishes of the Rio Chucunaque drainage, several forms believed to be new were encountered and are herewith described. The fish fauna of this river and its tributaries, as anticipated, was found to be substantially the same as that of the Rio Tuyra<sup>1</sup> with which it is directly connected, as the two streams form the main branches of the system draining the Tuyra basin, converging not far above brackish water to flow into the Pacific Ocean jointly. Prior to our entry no ichthyological collection had been made in the Chucunaque. The present paper is concerned only with the descriptions of the five new forms collected, all discussion being reserved for the full account of the fishes of this drainage, now in the course of preparation.

### *Loricaria altipinnis*,<sup>2</sup> new species

TYPE.—No. 8404, A. M. N. H.; standard length, without caudal, 154 mm.; Rio Chico, Darien, Panama.

Head, 4.6; depth, 10.5; dorsal, I, 7; anal, I, 5; lateral scutes, 29. Body low, depressed throughout, caudal peduncle much broader than deep, head very low; snout obtuse, its margin granulate and with some short bristles, 2.1 in head; a distinct orbital notch; eye, 7.5 in head; interorbital with a ridge over each eye, 4.6 in head; mouth rather narrow, premaxillaries with bifid teeth, right, 10, left, 9; lips large, papillose, the margin of the lower lip fringed, the barbel shorter than eye; lower surface of head naked; the rest of the head and body completely covered with bony scutes and plates except a practically obsolete naked area behind pectorals, two lateral keels anteriorly, becoming approximated on the sixteenth scute, occipital and predorsal scutes weakly carinate, scutes on chest and abdomen mostly small, those between the ventral fins enlarged, a single plate in advance of vent, bordered anteriorly by three enlarged scutes, seven very irregular rows across abdomen,

<sup>1</sup>The fishes of the Rio Tuyra have been made known principally through the work of Meek and Hildebrand and are covered in 'The Fishes of the Fresh Waters of Panama' by Seth E. Meek and Samuel F. Hildebrand, Field Mus. Nat. Hist., Pub. 191, Zool. Series, X, No. 15, Dec. 28, 1916.

<sup>2</sup>Named *altipinnis* in allusion to the relatively high fins.

sixteen scutes from anal to base of caudal; width at pectorals slightly greater than distance from pectorals to snout; origin of dorsal over base of ventrals, dorsal spine slightly longer than width of head, distance from origin of dorsal to tip of longest deflexed ray equal to distance from tip of snout to posterior edge of occipital plate, margin of dorsal practically straight when extended, the anterior rays of the deflexed fin reaching beyond the tips of the posterior ones; margin of caudal concave, the upper spine somewhat enlarged and bearing a filament about equal to the length of

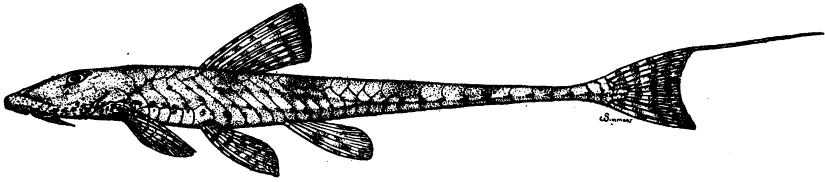


Fig. 1. *Loricaria altipinnis*, new species. Type.

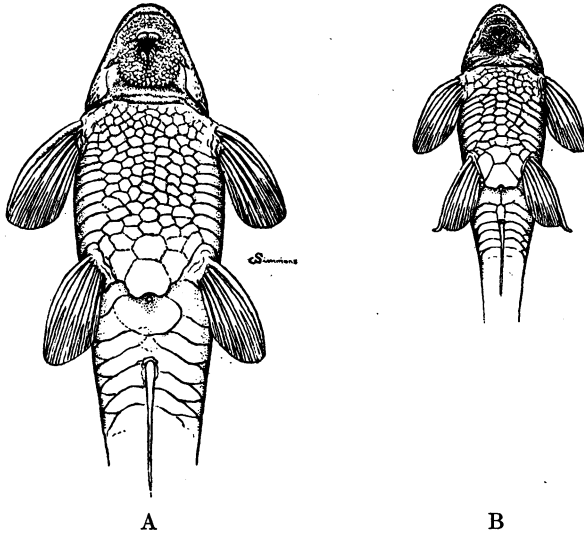


Fig. 2. *Loricaria altipinnis*, new species.

A.—Ventral view of type.

B.—Ventral view of a 94 mm. specimen.

the dorsal spine, as measured from the tip of the longest caudal ray; anal fin small, its origin in advance of tips of deflexed dorsal rays by the width of the interorbital, distance from origin of anal to tip of longest deflexed ray equal to the distance from the tip of snout to a point well past the orbital notch, anterior rays of deflexed anal reaching past tips of the posterior ones; ventrals reaching origin of anal, the outer ray not produced; pectoral fins slightly shorter than ventrals, hardly reaching the base of the latter, 1.4 in head; the spine bearing short bristles. Color brownish above, lighter below, the back crossed by six darker bars, the first on nape, indistinct, the

second at base of dorsal, the rest approximately equidistant on the remainder of the body. All fins yellowish with dark spots, anal with fewest and lightest ones.

There are eleven paratypes from various localities in the same river system. These range from 38 to 163 mm. and vary from the type in the following proportions: head, 4.2 to 4.6; depth, 10.0 to 12.5; lateral scutes, 28 or 29; snout, 2.1 to 2.4; eye, 5.0 to 8.0; interorbital, 4.0 to 5.1; abdominal plates, 3 to 7; pectorals, 1.3 to 1.4. Only one compares in size with the type (163 mm.), the rest not exceeding 94 mm. These all show various rather constant deviations taken to be juvenile characters. They are as follows: abdominal plates, 3, the larger individuals showing what appear to be evidences of these breaking up into a greater number (see Figure 2, *B*); a narrow naked area behind pectorals barely evident; outer ventral ray slightly produced; snout, 2.2 to 2.4; eye, 5.0 to 7.5. The free part of the maxillary barbel is scarcely equal to the width of the bony ridge between the nostrils in the two large examples and is greater than that distance in the small. The coloration of the smaller group is similar to, but darker than, that of the two large examples which are inclined to tan whilst these tend toward a Vandyke brown.

This species appears to be rather close to *L. magdalenæ* Steindachner and *L. jubata* Boulenger of farther south, but in certain respects resembles *L. uracantha* Kner and Steindachner of the Atlantic slope. It is not unlikely that this is the fish on which previous records of *L. uracantha* from the Pacific drainage were made, the validity of which Meek and Hildebrand<sup>1</sup> are inclined to doubt. Mr. Hildebrand kindly compared his Atlantic slope material with the present specimens and called my attention to various differences mentioned herewith that I otherwise would not have known.

*L. altipinnis* may be distinguished from *L. magdalenæ* by the lateral scutes being approximated instead of united and that, except in the young, the naked area behind the pectoral is nearly obsolete, the outer ventral ray is not produced and there are more plates on the abdomen.

It may be distinguished from *L. jubata* by the lateral scutes being approximated instead of united, and the width at the pectorals being greater than the distance from the pectorals to snout.

It may be distinguished from *L. uracantha* by the anterior rays of the dorsal reaching beyond those of the posterior ones when depressed, instead of being co-terminous; the distance from origin of dorsal to longest deflexed ray being equal to the distance from the tip of snout to

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<sup>1</sup>See foot note on page one for reference (p. 257).

posterior margin of occipital plate instead of to the middle of that plate; the distance from origin of anal to longest deflexed ray being equal to the distance from the snout to a point well past the orbital notch instead of to its posterior margin. The smaller examples differ greatly from young *L. uracantha* of the same size, as those closely resemble the larger examples of that form, instead of differing from them, as previously noted for the present species.

***Apareiodon compressus*,<sup>1</sup> new species**

TYPE.—No. 8408, A. M. N. H.; standard length, without caudal, 23 mm.; Rio Tuquesa, Darien, Panama.

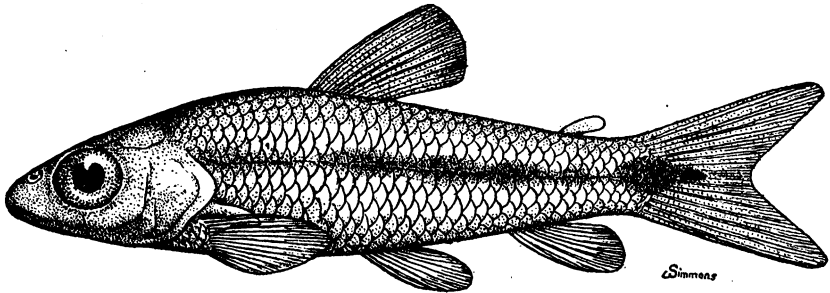


Fig. 3. *Apareiodon compressus*, new species. Type.

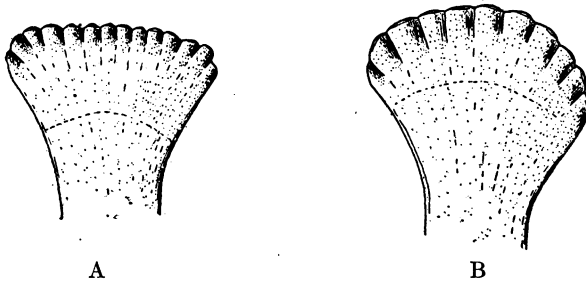


Fig. 4. Premaxillary teeth of *Apareiodon* from Eastern Panama.

A.—*A. dariensis* Meek and Hildebrand.  
B.—*A. compressus*, new species.

Head, 3.2; depth, 3.9; dorsal, 11; anal, 9; lateral line, 36. Body elongate, somewhat compressed, depth twice width, dorsal profile convex, somewhat flattened at nape, lower outline anteriorly slightly flattened; head width, 1.4 in head depth; snout bluntly pointed, not much in advance of mouth, 4.4 in head; eye, 3.0; inter-orbital, 3.1; mouth very small, inferior, the lower lip with a nearly straight margin, lower jaw toothless; teeth in upper jaw large, closely set, overlapping, wide at tips,

<sup>1</sup>Named *compressus* in allusion to the relatively great compression for an *Apareiodon*.

narrow at bases, the cutting edge slightly rounded with a pectinate margin, their long axis nearly horizontal; lateral line straight, well developed, scales moderate, regularly placed, twelve median series in advance of dorsal, three complete horizontal rows between lateral line and base of anal; dorsal fin inserted in advance of ventrals; its origin about midway between snout and caudal base; adipose fin moderate, anal fin small, shorter than dorsal, its origin nearer base of caudal than origin of ventrals; ventral fins broad, 9 rays, reaching past vent; pectorals broad, 14 rays, inserted under margin of opercule, not reaching to ventrals. Color only slightly darker above than below, sides with a single dark lateral band following the lateral line most prominent between dorsal and adipose, becoming obsolescent cephalad, about as wide as diameter of pupil. Caudal base with a large black more or less rhomboidal spot the long axis of which nearly equals the postorbital part of head, the shorter vertical axis of which nearly equals the snout, no dark cloudings or other marks on body, dorsal and caudal slightly dusky, other fins plain. Viewed dorsally the nape is marked with a dark triangular area pointing backward from which is produced a fine dark median line reaching the dorsal.

This single specimen is referred to *Apareiodon* chiefly on its dentition and various minor details in which it resembles this genus, although in general appearance it is rather different. Probably these apparent differences are due to youthful characters, and it is possible that adult material would necessitate removal to another genus, although it does not seem that even in such a case the present specimen would represent the young of a known form.

• *Characidium marshi*,<sup>1</sup> new species

TYPE.—No. 8405, A. M. N. H.; standard length, without caudal, 44 mm.; Rio Sucubti, Darien, Panama.

Head, 3.4; depth, 3.9; dorsal, 11; anal, 9; lateral line, 35. Body elongate, sub-cylindrical, dorsal profile convex, lower outline somewhat flattened; snout bluntly pointed, 4.9 in head; mouth sub-terminal, maxillary reaching eye; teeth conical in upper jaw, weakly tricuspid in lower, central cusp dominant, slightly recurved; gill membranes free; eye, 4.1 in head; scales regular, eleven predorsal; lateral line weakly developed, complete, slightly decurved; five horizontal scale rows across peduncle from one lateral line to the other, seven complete horizontal rows between dorsal and ventral; dorsal fin inserted in advance of ventrals, about midway between tip of adipose and anterior margin of eye, its base about 2 in distance to tip of adipose, 7 in length; adipose over last anal rays, 4th reaching considerably past last when depressed, but not to caudal base; pectorals equal to head, just reaching ventrals, tips of outer rays thickened. Body coloration dark above and paler below, a longitudinal dark bar, not as wide as eye separating the two. Above these the scale centers are somewhat lighter, giving the suggestion of horizontal lines. The dark band is crossed by seven definite, short, nearly equidistant vertical bars not as long as the depth of peduncle and extending an equal distance above and below longitudinal band which

<sup>1</sup>Named *marshi* in recognition of the service of Mr. Richard O. Marsh to ichthyology in making possible, both by financial support and personal encouragement, the collection in which these various undescribed forms were found.

originates and terminates in a dark spot, the anterior, shoulder spot small and inconspicuous, the posterior, peduncular spot large and prominent, extending on bases of middle caudal rays, nearly as large as eye and encompassing a small black dot. Dorsal dusky, crossed by a dark bar nearly a snout's distance from its base, other fins plain dusky. A prolongation of the lateral band shows faintly on the rather dark head, decurving to pass through the eye and to meet its fellow of the opposite side around the snout.

There are ten paratypes, two from the type locality and eight from various points on the Rio Sucubti and its tributaries. Only the former compare with the type in size. The others range from 15 to 30 mm. and show considerable variation, especially in color and pattern. The entire lot, including the type, show the following range of variations: head, 3.3 to 3.8; depth, 3.9 to 4.7; snout, 4.0 to 4.3; pectoral, in head, 0.8 to

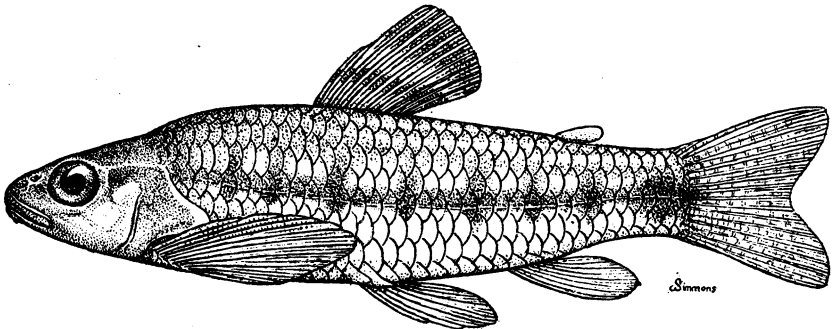


Fig. 5. *Characidium marshi*, new species. Type.

1.1; dorsal, 11; anal, 7 to 9; predorsal scales, 10 to 11; scales across peduncle, 5 to 7; lateral line, 31 to 35. The smaller fishes, with the exception of the two largest of them, are all very much lighter than the type and those of a similar size, and the vertical bars, which extend from the dorsal to the ventral surface, reach as high as ten in number. These differences in color and pattern, in common with other species of this genus, seem to be juvenile characters.

In general form and pattern this species most closely resembles *C. phoxocephalum* Eigenmann of northern South America, but differs in the coloration of the dorsal and anal, pattern on the sides, size of head, snout, shape of opercular flap and lateral line count.

**Rivulus chucunaque**,<sup>1</sup> new species

TYPE.—No. 8406, A. M. N. H.; standard length, without caudal 45 mm.; Rio Chucunaque, in a small side stream near Yavisa, Darien, Panama.

Head, 4.2; depth, 4.9; dorsal, 9; anal, 14; lateral scale series, 38. Body long, slender, posteriorly compressed; head depressed, wider than deep; snout broad, 4.4 in head; eye, 3.1; interorbital broad, 2.9; mouth oblique, lower jaw projecting; teeth in jaws in bands, outer ones slightly enlarged, curved inward; nine longitudinal rows of scales between base of dorsal and anal; origin of dorsal over posterior part of anal, about midway between tip of caudal and a point half an eye's diameter behind head; caudal fin rounded; anal fin inserted slightly nearer tip of caudal than tip of snout, the length of its base not quite equal to width of head; ventral fins small, little longer than eye, scarcely reaching vent; pectorals not reaching base of ventrals by an eye's diameter, 1.5 in head; peduncle, 2 in head, 8 in length. Sides suffused

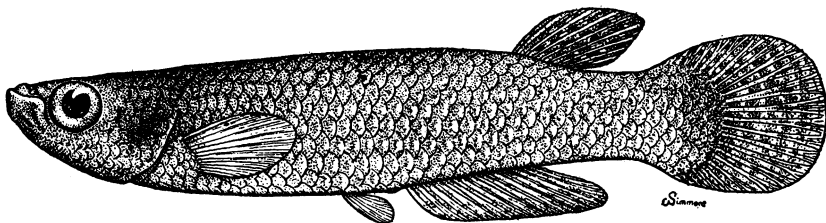


Fig. 6. *Rivulus chucunaque*, new species. Type.

with pale blue, darker above, lighter below, sprinkled with pink dots, one to a scale and following horizontal scale rows, giving the appearance of dotted lines, most prominent on lower part of sides; no peduncular ocellus or other markings; dorsal and caudal profusely spotted with dark spots, somewhat fainter on lower half of caudal, which is tipped with a narrow light blue edging, broadest upward; anal pale lemon-yellow with pink dots proximally, on rays, showing some faint dark spots posteriorly; ventrals tipped with yellow; pectorals plain.

There are thirty-two paratypes, eight from the type locality and twenty-four from a nearby stream. These range from 25 to 45 mm. in length and show the following range of variations: head, 3.4 to 4.0; depth, 4.8 to 5.5; snout, 4.4 to 5.8; eye, 2.9 to 3.3; interorbital, 2.5 to 3.3; peduncle in head, 1.9 to 2.2, in length, 7.3 to 8.5; dorsal, 8 to 9; anal, 13 to 14; lateral line, 36 to 40.

*R. chucunaque* appears to be close to *R. brunneus* Meek and Hildebrand of the Atlantic drainage, in proportions, but differs decidedly in coloration, the latter having brownish sides with black dots and only faint spots on the caudal and dorsal.

<sup>1</sup>Named "*chucunaque*," being known only from the Rio Chucunaque drainage system.

***Rivulus chucunaque sucubti***,<sup>1</sup> new subspecies

TYPE.—No. 8407, A. M. N. H.; standard length, without caudal, 39 mm.; Rio Sucubti, in a small side stream, Darien, Panama.

Head, 3.8; depth, 4.6; dorsal, 8; anal, 14; lateral scale series, 35. Similar to the type of *R. chucunaque* except in the following respects: snout, 5.2; eight longitudinal rows of scales between base of dorsal and anal; origin of dorsal slightly nearer head than tip of caudal; ventral fins longer than eye, reaching anal; pectorals, 1.3 in length, reaching to within half an eye of ventrals; caudal peduncle 1.8 in head, 7 in length. The longitudinal rows of pinkish dots very faint; spots on caudal, dorsal and anal fewer and larger, terminal ending of bluish on caudal brighter and broader, about one-half eye, next to which is a dark band nearly the same width; tip of dorsal slightly reddish, anal more generally spotted. In preservative decidedly more brownish than *R. c. chucunaque* which tends more to a slaty hue.

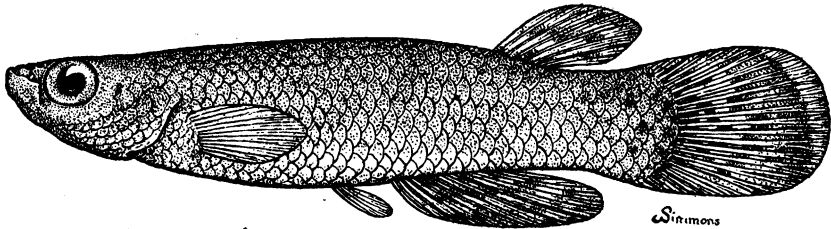


Fig. 7. *Rivulus chucunaque sucubti*, new subspecies. Type.

There are forty-five paratypes, ranging from 18 to 47 mm. in length, two from the type locality and forty-three from other points close by. The range of variations in proportions is as follows: head, 3.5 to 4.2; depth, 4.5 to 5.6; snout, 4.2 to 5.9; eye, 3.1 to 3.4; interorbital, 2.6 to 3.3; peduncle in head, 2.0 to 2.4; in length, 7.0 to 8.9; dorsal, 7 to 9; anal, 13 to 14; lateral line, 36 to 39.

Some of these examples approach very closely to the condition found in the down-stream *R. c. chucunaque*, the type representing the opposite extreme, but there is no corresponding approach of those to this up-stream form. The ventral and vertical fins tend to be longer in the present subspecies, although some are as short as those of the former; the coloration varies from that of the type to close to that of the former, but in life, even those that approach *R. c. chucunaque* most closely have a rather intangible, although quite real, different appearance. In preservative they show color-differences as noted in the type description. The body proportions show only trifling differences, probably hardly available for taxonomic purposes. The depth and snout average somewhat larger

<sup>1</sup>Named *sucubti*, being known only from the Rio Sucubti drainage.



in the present form and the interorbital somewhat smaller, as tabulated below.

	Average of 14 examples each	
	<i>R. c. chucunaque</i>	<i>R. c. sucubti</i>
Depth	5.1	5.0
Snout	4.8	4.7
Interorbital	2.9	3.0

In the present form the dorsal tends to have one less ray and the anal one more, the lateral scale series averages two less and the horizontal scale rows between the dorsal and anal one. This latter seems to be the most constant difference.

